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NEVADA'S EXPERIENCE WITH THE CHUKAR PARTRIDGE

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GORDON W. GULLION
WILDLIFE TECHNICIAN, NEVADA FISH AND GAME COMMISSION

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FIRST, I MUST THANK GLEN CHRISTENSEN, ASSISTANT PROJECT LEADER ON NEVADA'S UPLAND GAME SURVEY FOR PERMITTING ME TO USE A GREAT DEAL OF MATERIAL FROM HIS UNPUBLISHED THESIS ON THE ECOLOGY OF THE CHUKAR PARTRIDGE IN WESTERN NEVADA.

IMPORTANCE

SINCE ITS FIRST INTRODUCTION ONTO NEVADA'S GREAT BASIN RANGES IN 1934, THIS BIRD HAS RISEN TO BECOME PROBABLY THE THIRD MOST IMPORTANT GAME ANIMAL IN THE STATE, AND CERTAINLY THE SECOND MOST IMPORTANT GAME BIRD. FROM OUR 1951 ANNUAL HUNTER QUESTIONAIRE IT HAS BEEN ESTIMATED THAT 4,666 LICENSED HUNTERS HARVESTED 36,184 CHUKARS AS COMPARED WITH 5,480 HUNTERS TAKING 21,239 SAGE GROUSE. THUS, IN 1951, OVER 15 PERCENT OF NEVADA'S RESIDENT LICENSED HUNTERS SUCCESSFULLY PURSUED THE WARY AND FLEET-FOOTED CHUKAR. THESE FIGURES DO NOT INCLUDE THE KILL BY PERSONS UNDER 16 YEARS OF AGE WHO ARE NOT REQUIRED TO HAVE LICENSES. SEVENTY PERCENT OF THIS CHUKAR KILL WAS WITHIN 40 MILES OF THE RENO-SPARKS AREA, LEAVING THE BULK OF THE BIRD POPULATION COMPARATIVELY UNHARVESTED.

RECORD OF INTRODUCTIONS

THE FIRST KNOWN CHUKAR RELEASES WERE MADE IN THE FALLON AREA OF CHURCHILL COUNTY IN 1934. THESE BEING THE OFFSPRING OF BIRDS IMPORTED FROM CALCUTTA, INDIA THE PREVIOUS YEAR. ABOUT THE SAME TIME CHUKARS WERE RELEASED IN THE TRUCKEE RIVER CANYON, EAST OF RENO. SUBSEQUENTLY, AT LEAST 3,000 GAME FARM BIRDS FROM OUTSIDE OF NEVADA HAVE BEEN RELEASED AND ANOTHER 1,400 WILD-TRAPPED CHUKARS REDISTRIBUTED. EVERY COUNTY IN THE STATE HAS APPARENTLY HAD CHUKARS RELEASED, WITH THE BULK OF THE PLANTS BEING MADE IN CHURCHILL, NYE AND PERSHING COUNTIES. MOST OF THE RELEASES WERE MADE FROM 1936 TO 1941.

All of the early releases were made by private individuals, sportsmen's organizations and the various County Game Management Boards. Alcorn and Richardson (1951:266) believe that the total liberations numbered "between five and ten thousand individuals." Coleman (1949:135) believes that the "number of failures was greater than those which resulted in established populations." Many of the releases were of small numbers of birds, in fact most of them seem to have been that way. Groups of as few as 10 Chukars have been released and a 30 bird plant seems to have been about average in Nye County. The plants were apparently made on the assumption that a 50-50 sex ratio existed.

By 1947 Chukars were numerous enough that a day open season was possible. Since then seasons have been possible each year with increasing lengths and hunter success. In 1948 the season varied from 3 to 15 days, with a three bird daily bag limit. In 1949 the season lasted for 2 to 15 days with a five bird daily bag limit. In 1950 the open season varied from 2 to 31 days, again with the five bird bag and possession limit.

In 1951, three counties (Churchill, Lander and Pershing) had the season open from September 30 to November 30, 62 days. Nye County was open from September 30 to November 4, 36 days, and six other counties (Esmeralda, Lyon, Mineral, Ormsby, Storey and Washoe) were open from September 30 to October 31, 32 days. Humboldt County was open from November 18 to December 2, 15 days; Eureka County was open the first week in October, 7 days; and White Pine County was open for 2 days, September 30 and October 1. Bag and possession limits in all areas were still five Chukars.

The proposed 1952 Chukar seasons range up to as long as 60 days. The practice of opening the Chukar season in late September may be detrimental to the overall hunt. Chukars are generally still restricted to the immediate vicinity if water holes and excessive kills occur in heavily hunted areas. Season opening after the commencement of fall rains would permit a dispersal of birds and reduce excessive pressure on easily accessible populations. We have had the same problem regarding

SAGE GROUSE AND THIS YEAR WILL HAVE A SOMEWHAT LATER HUNT THAN HAS BEEN CUSTOMARY.

DISTRIBUTION AND HABITAT

DESPITE THE WIDESPREAD INTRODUCTIONS WITHIN NEVADA, ESTABLISHMENT OF SHOOTABLE POPULATIONS HAS BEEN GENERALLY LIMITED TO THE WEST-CENTRAL AND CENTRAL PART OF THE STATE. THIS PART OF NEVADA IS TYPICAL GREAT BASIN COUNTRY, WITH VALLEY FLOORS AT FROM ABOUT 4,000 TO 5,500 FEET ELEVATION. THE AREA IS WELL INTERSPERSED WITH RUGGED GREAT BASIN RANGES WITH PEAKS REACHING 7,000 TO 10,000 FEET ELEVATION. THE BULK OF THE WELL ESTABLISHED POPULATIONS ARE IN AREAS WITH A JANUARY AVERAGE TEMPERATURE ABOVE 28°F AND UNDER 40°F. THE 40°F ISOTHERM PRETTY ACCURATELY INDICATES THE NORTHERN LIMIT OF THE MOHAVE DESERT TYPE IN NEVADA.

RELEASES IN THE COLDER AND HIGHER PORTIONS OF NORTHEASTERN NEVADA HAVE BEEN GENERALLY UNSUCCESSFUL, WITH THE BIRDS JUST HOLDING THEIR OWN AT BEST. RELEASES MADE IN THE SOUTHERN DESERT VALLEYS AND RANGES HAVE FAILED COMPLETELY.

SUCCESSFUL ESTABLISHMENT HAS BEEN MADE ONLY IN AREAS OF THE SAGEBRUSH-UTAH JUNIPER PLANT FORMATION, WITH GENERALLY STEEP, ROCKY TERRAIN, AND READILY AVAILABLE WATER. FROM THIS BASIC TYPE OF HABITAT CHUKARS RANGE UPWARDS INTO THE PINYON PINES AND DOWNWARDS INTO HAY FIELDS AROUND RANCHES.

FOOD STUDIES

TO DATE FOOD STUDIES HAVE BEEN OF VERY LIMITED SCOPE, BUT CHRISTENSEN FOUND CHEATGRASS AND FIDDLENECK TO BE IMPORTANT CHUKAR FOODS IN THE RENO AREA. BOTH OF THESE PLANTS ARE MOST ABUNDANT ON BURNED-OVER SAGEBRUSH RANGE LANDS.

CHRISTENSEN (1952:48-51), REPORTING UPON THE ANALYSIS OF 29 CHUKAR CROPS, EVENLY DISTRIBUTED THROUGH THE YEAR, FOUND THE FOLLOWING FOOD PICTURE: FROM NOVEMBER THROUGH MARCH, GREEN GRASS LEAVES MADE UP FROM 73 TO 99 PERCENT OF CROP CONTENTS; FIDDLENECK (AMSINCKIA TESSELLATA - STEMS, LEAVES, BUDS, CALYX AND SEEDS) APPEARED FIRST IN MARCH AND WAS VERY IMPORTANT (TO 54%) FROM APRIL THROUGH SEPTEMBER. INSECTS WERE ALSO TAKEN IN CONSIDERABLE NUMBERS BY ADULT BIRDS IN SPRING AND SUMMER. IN JULY, CHEATGRASS (BROMUS TECTORUM - SEEDS) BEGAN TO SHOW UP IN ABUNDANCE AND REMAINED IMPORTANT

UNTIL NOVEMBER. FILAREE (EREDIUM CICUTARIUM - SEEDS) WAS FAIRLY IMPORTANT IN AUGUST AND AGAIN IN OCTOBER. SOME OTHER FOODS THAT WERE FOUND IN CONSIDERABLE VOLUME AT ONE TIME OR ANOTHER WERE: LESSER GILIA (GILIA INCONSPICUA - CAPSULES AND BRACTS), CURLY DOCK (RUMEX CRISPIS - SEEDS), INDIAN MOUNTAIN RICE (ORYZOPSIS HYMENOIDES - SEEDS), HEDGEMUSTARD (SISYMBRIUM SP. - SEEDS AND PODS), BLACK NIGHTSHADE (SOLANUM NIGRUM - FRUITS) AND BLUE-GRASS (POA SECUNDA - ROOTSTOCKS AND SHOOTS).

EARLIER, ALCORN AND RICHARDSON (1951:270-271), IN ANALYSES OF 41 CROPS, MOSTLY FROM CHUKARS KILLED DURING HUNTING SEASON IN CENTRAL AND WEST-CENTRAL NEVADA, FOUND CHEATGRASS SEEDS MOST FREQUENT, BLUE-GRASS LEAVES SECOND AND FILAREE SEEDS THIRD.

NUTS FROM THE PINYON PINE (PINUS MONOPHYLLA) ARE IMPORTANT AND SOME CROPS HAVE BEEN FOUND CONTAINING LARGE QUANTITIES OF MORMON TEA SEEDS (EPHEDRA NEVADENSIS). THE BULBS OF WILD ONIONS ARE TAKEN COMMONLY AT SOME TIMES OF THE YEAR, IMPARTING A VERY STRONG FLAVOR TO THE MEAT OF THE BIRDS AND IN FACT OFTEN MAKING THEM UNDESIRABLE. CHUKARS ARE DIGGERS, USING THEIR BILLS EFFECTIVELY, AND HENCE AN IMPORTANT PART OF THEIR FOOD CONSISTS OF ROOTS, BULBS AND TUBERS. IN SOME AREAS THEY DAMAGE POTATO CROPS BY DIGGING UP THE YOUNG POTATOES.

LIMITING FACTORS

THE FACTORS APPARENTLY LIMITING CHUKAR DISTRIBUTION VARY FROM AREA TO AREA. IN THE NORTHEASTERN PART OF NEVADA THE DEEP AND PERSISTENT WINTER SNOWS SEEM TO BE IMPORTANT. CHUKARS DO WELL ENOUGH IN SNOW COUNTRY IF THEY ARE ABLE TO DESCEND TO SNOW-FREE VALLEYS. THEY ALSO FREQUENT THE HIGHER RIDGES THAT ARE EXPOSED BY WIND. EXTREME COLD TEMPERATURES DO NOT SEEM TO BE AS IMPORTANT AS THE DEPTH AND PERSISTENCE OF SNOW.

IN THE SOUTHERN PART OF THE STATE WATER MAY BE LIMITING, HOWEVER, THE LACK OF SUITABLE FOOD IS PROBABLY MORE IMPORTANT. ON THE FEW SOUTHERN NEVADA RANGES THAT APPROACH CENTRAL NEVADA CONDITIONS, WATER IS RELATIVELY WELL DISTRIBUTED. HOWEVER, DURING MOST YEARS FIDDLENECK IS NON-EXISTENT AND GENERALLY SCARCE EVEN IN GOOD YEARS. FILAREE IS OFTEN ABUNDANT DURING GOOD YEARS, BUT NOT IN AREAS WITH EITHER THE DIS-

TRIBUTION OF WATER NOR THE GENERAL COVER REQUIREMENTS OF THE CHUKAR. A CLOSE CHECK IS BEING KEPT ON AN ATTEMPTED CHUKAR ESTABLISHMENT IN THE PROVIDENCE MOUNTAINS OF CALIFORNIA. THIS RANGE IS SIMILAR TO AND NOT FAR FROM SOME OF OUR DESERT RANGES WHICH ARE BELIEVED TO BE MOST NEARLY SUITABLE FOR CHUKARS.

THE LIMITS OF ADAPTABILITY OF THIS ONE RACE OF THE WIDESPREAD RED-LEGGED ROCK PARTRIDGE OF THE OLD WORLD HAVE NOT BEEN THOROUGHLY TESTED IN NEVADA AS YET, BUT APPARENTLY THE WEST-CENTRAL PART OF THE STATE COMES NEAREST TO THE CENTER OF THE SPREAD OF GENETIC ADAPTABILITY IN THE CHUKAR. THIS AREA MUST BE MOST LIKE THE CHUKAR'S NATIVE HOME ON THE SLOPES OF INDIA'S HIMALAYAN RANGE. ALDRICH (1947:6) SAYS, "THE CHUKAR ROCK PARTRIDGE IN ITS NATIVE LAND IN THE HIMALAYAS OF NORTHERN INDIA INHABITS OPEN GRASSLAND AND IS FOUND IN EVEN THE BAREST, MOST INHOSPITABLE COUNTRY, KEEPING TO ROCKY HILLSIDES, RAVINES, AND BOULDER-STREWN PLATEAUS." THIS WELL DESCRIBES THE ENVIRONMENT OCCUPIED BY THIS SPECIES IN NEVADA.

IT SEEMS PROBABLE THAT THIS RACE HAS A RATHER LIMITED ADAPTABILITY AND THAT PLANTINGS FAIL UNLESS THE HABITATS IN WHICH RELEASED ARE MADE FALL WITHIN THE RATHER NARROW CONFINES OF THE CHUKAR'S NATIVE ADAPTABILITY.

THE FACT THAT APPARENTLY MOST OR ALL OF THE WIDESPREAD PLANTING ATTEMPTS IN THE UNITED STATES UNTIL RECENTLY HAVE BEEN MADE WITH BIRDS DERIVED FROM THE SAME RACIAL STOCK (ALDRICH, 1947:7), MAY BE IMPORTANT IN CONSIDERING FUTURE CHUKAR PLANTING. BIRDS WITH THE WIDER GENETIC ADAPTABILITY AND GREATER VIGOR OF HYBRID STOCK MAY PROVE SUCCESSFUL IN A WIDE RANGE OF ENVIRONMENTS NOT PRESENTLY STOCKED. OR ANOTHER OF THE 22 RACES OF THIS SPECIES MAY PROVE TO HAVE THE HABITAT REQUIREMENTS MET BY OTHER AREAS IN THE WESTERN STATES. I BELIEVE THAT THE HYBRID RING-NECKED PHEASANT HAS SHOWN ITSELF TO BE ADAPTABLE IN A NUMBER OF HABITATS WHERE BIRDS OF PURE RACIAL STOCK COMPLETELY FAILED.

ECONOMICS

FOR STATES STILL INTERESTED IN ESTABLISHING CHUKARS OR ITS CLOSE RELATIVES, SOME COST FIGURES MAY BE OF INTEREST. IN 1949 NEVADA COMMENCED GAME FARM PRODUCTION

OF CHUKARS AND DURING THE TWO YEARS OF OPERATION RELEASED 1,300 BIRDS IN UNINHABITED AREAS. HOWEVER, SINCE PRODUCTION COST FOR PHEASANTS AND CHUKARS WERE NOT KEPT SEPARATELY A COST PER BIRD IS NOT AVAILABLE. OPERATION OF NEVADA'S GAME FARM HAS BEEN DISCONTINUED AND ALL THE BREEDING STOCK RELEASED.

FROM 1939 TO 1943 THE NYE COUNTY GAME MANAGEMENT BOARD PURCHASED AND RELEASED ABOUT 1,500 BIRDS AT A COST RANGING FROM $1.19 TO $4.00 PER BIRD. THESE BIRDS WERE OBTAINED MAINLY FROM PRIVATE SOURCES IN CALIFORNIA (CHRISTENSEN, 1952, IN LITT.).

WILD CHUKAR TRAPPING AND REDISTRIBUTION IN 1947 COST ABOUT $2.15 PER BIRD, FOR NEARLY 1,000 BIRDS MOVED. ANOTHER WILD TRAPPING ATTEMPT IN SEPTEMBER AND OCTOBER OF 1949 NETTED 469 CHUKARS AT A COST OF $2.75 PER BIRD (NILSSON, 1952, IN LITT.).

CHRISTENSEN BELIEVES THAT WATER-HOLE TRAPPING CAN BE DONE IN AUGUST AND EARLY SEPTEMBER AT A MUCH LOWER COST THAN HAS BEEN EXPERIENCED TO DATE. OF COURSE, WILD TRAPPED BIRDS, IF HANDLED PROPERLY, HAVE MUCH THE BEST CHANCE FOR ULTIMATE SUCCESS IN THEIR NEW ENVIRONMENT.

SUMMARY

IN BRIEF REVIEW, DURING THE 18 YEARS THAT THE CHUKAR PARTRIDGE HAS BEEN A WILD BIRD IN NEVADA IT HAS RISEN TO A PLACE OF PROMINENCE ON OUR GAME LIST, EXCEEDED ONLY BY THE SAGE GROUSE AND MULE DEER. FROM THE 5,000 PLUS BIRDS RELEASED SINCE 1934, A HARVEST OF OVER 36,000 CHUKARS WAS REALIZED IN 1951, WITH 70 PERCENT OF THAT HARVEST BEING MADE WITHIN 40 MILES OF THE POPULATION CENTER OF RENO.

THE CHUKAR HAS FOUND THAT THE SAGEBRUSH AND JUNIPER COVERED GREAT BASIN VALLEYS AND RANGES OF WEST-CENTRAL NEVADA MATCHES ITS RANGE OF GENETIC ADAPTABILITY, AND HAS PROSPERED THERE WITHOUT DISPLACING ANY NATIVE GAME BIRD.

SINCE SOME OF THE MOST IMPORTANT CHUKAR FOODS ARE THE PIONEERING PLANTS FOLLOWING RANGE FIRES, THE VALUE OF SAGEBRUSH BURNING IN CHUKAR MANAGEMENT AND DISTRIBUTION MUST BE CONSIDERED.

TO DATE, THE COST PER RELEASED CHUKAR HAS BEEN LOWEST FOR GAME FARM BIRDS. HOWEVER, IN THE LONG RUN, THE COST PER ESTABLISHED BIRD IS PROBABLY LOWEST FOR

WILD-TRAPPED BIRDS SINCE THEIR CHANCE FOR SURVIVAL IN A NEW ENVIRONMENT IS PROBABLY VERY MUCH GREATER THAN THAT OF BIRDS RELEASED FROM THE DOMESTICATION OF GAME FARMS.

OF COURSE, THIS COMPARISON IS VALID ONLY FOR STATES THAT HAVE ESTABLISHED CHUKAR POPULATIONS.

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